Premier Heat Pumps

WALL MOUNTED SPLIT-TYPE AIR CONDITIONERS

SERVICE MANUAL

No.TE080403

Model
PHP-5800/MI

CONTENTS

1. IMPORTANT NOTICE ·····2
2. TECHNICAL SPECIFICATION ·····3
3. OPERATION DETAILS ·····4
4. WIRING DIAGRAM ····· 11
5. EXPLOSION VIEW ·····12
6. PARTS LIST ·····13

IMPORTANT NOTICE

This service manual is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair the appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

The information, specifications and parameter are subject to change due to technical modification or improvement without any prior notice. The accurate specifications are presented on the nameplate label.

How to order spare parts

To have your order filled promptly and correctly, please furnish the following information:

1. Model No. with Indoor or Outdoor
2. No. in the Explosion View
3. Part Name
4. The quantity you ordered

Technical Specifications

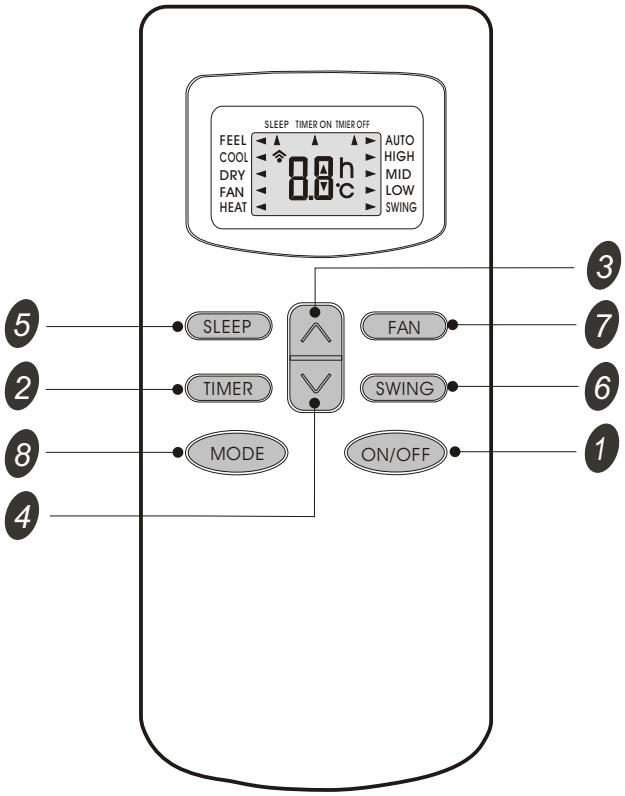
Model No.			**PHP-5800/MI**			
Type			Heat Pump			
Control type			Remote			
Rated cooling capacity		Btu/h	18000			
Rated heating capacity		Btu/h	20000			
EER for cooling		Btu/h.w	11.04			
COP for heating		W/W	3.2			
Moisture removal		Liters/h	2			
Indoor noise level at cooling	High	dB(A)	42			
	Med.	dB(A)	40			
	Low	dB(A)	38			
Outdoor noise level		dB(A)	58			
Electrical Data						
Power supply			220-240V~/50Hz			
Voltage Range		V	165~265			
Rated current	Cooling	A	7.4			
	Heating	A	8.3			
Rated input	Cooling	W	1630			
	Heating	W	1830			
Refrigerating System						
Refrigerant/Charge		Gram	R410A/1500g			
Compressor	Type		DC INVERTER			
	Model		----			
	LRA	A	----			
	MFG		----			
Evaporator			Louver fin and grooved tube type (φ7)			
Condenser			Corrugated fin and grooved tube type (φ9.52)			
Expansion device			Capillary tube			
Defrosting system			Microcomputer controlled reverse system			
Fan System						
Indoor air circulation/Hi Cooling		m^3/h	750/850			
Indoor fan type			Cross flow			
Indoor fan speed H/M/L	Cooling	rpm	1300/1180/1050			
	Heating	rpm	1250/1120/950			
	Dry	rpm	1050			
	Sleep	rpm	1050			
Indoor fan motor output		W	23			
Outdoor air circulation		m^3/h				
Outdoor fan type			Propeller fan			
Outdoor fan speed		rpm	700/900			
Outdoor fan motor output		W	68			
Connections						
Refrigerant coupling			Flare type			
Connecting Pipe	Gas	Inches	1/2”			
	Liquid	Inches	1/4”			
Connecting Wiring	Size x Core number		4X1.5			
Drainage Pipe			O.D 16mm			
Others						
Suitable area		m^2	25~40			
Net dimensions (W x H x D)	Indoor	mm	898X280X202			
	Outdoor	mm	820 x606x300			
Net weight	Indoor	kg	14			
	Outdoor	kg	42			
Packing dimensions (W x H x D)	Indoor	mm	955x365x298			
	Outdoor	mm	955x650x435			
Gross weight	Indoor	kg	14			
	Outdoor	kg	46			
Loading Capacity	20’/40’/40’HQ		70/150/168			

Operation Details

Remote controller

Remote controller

The remote controller transmits signals to the system.



1 ON/OFF button
Used to start and stop operation when pressed.

2 TIMER button
Used to select TIMER operation.

3 UP button (TOO COOL button)
Used to increase the set room temperature and time.

4 DOWN button (TOO WARM button)
Used to decrease the set room temperature and time.

5 SLEEP button
Used to set or cancel sleep mode operation.

6 VANE control button
Used to adjust airflow direction.

7 FAN SPEED control button
Used to select the indoor fan motor speed: Auto, High, Mid and Low.

8 MODE button
Used to select the type of operation mode: Feel, Cooling, Dry, Fan and Heating(Only for Heat Pump).

Note: Each mode and relevant function will be further specified in following pages.

Remote Control
The remote controller is not presetted as Cooling Only Air Conditioner or Heat Pump by manufacturer.
Each time after the remote controller replace batteries or is energized, the arrowhead will flashes on the front of "Heat" or "Cool" on LCD of the remote controller.
User can preset the remote controller type depending on the air conditioner type you have purchased as follows:
Press any button when the arrowhead flashes on the front of "Cool", Cooling Only is set.
Press any button when the arrowhead flashes on the front of "Heat", Heat Pump is set.
If you don't press any button within 10 seconds, the remote controller is preset as Heat Pump automatically.

Note :
If the air conditioner you purchased is a Cooling Only one, but you preset the remote controller as Heat Pump, it doesn't bring any matter. But if the air conditioner you purchased is a Heat Pump one, and you preset the remote controller as Cooling Only, then you CAN NOT preset the Heating operation with the remote controller.

Electronic Controller

1. Safety Protection

(1) Time Delay for Safety protection

- 3 minutes delay for compressor ---The compressor is ceased for 3minutes before restarting to balance the pressure in the refrigeration cycle in order to protect the compressor.
- 2 minutes delay for 4-way valve---The 4-way valve will be ceased for 2 minutes late after compressor to prevent the refrigerant-gas abnormal noise when the HEATING operation is OFF or switch to the other operation mode.

(2) Discharge temperature protection

There is a temperature sensor on top of compressor, when temperature on top of compressor exceeded the limit, system control will shut down the compressor and the display board will show the error code.

(3) lower voltage protection

When AC voltage ≤158V and keep it for 10 seconds, unit will be shut down for protection.

(4) Over voltage protection

When AC voltage ≥260V, unit will be shut down and recover while AC≤255V.

(5) Over current protection

When the current of outdoor unit is overload, controller shut down the unit immediately and show error code.

(6) Compressor abnormity protection

When compressor start on or in the process of running, if there is no feedback to controller or load of compressor is abnormity, the air conditioner will shut down, and show error code.

(7) **IPM** module protection

IPM module has high temperature & over current protection itself, if there is signal feedback to IPM, the outdoor unit will shut down, LED on outdoor PCB will show the error code.

2. "I Feel" Mode Operation

(1) When the "I Feel" mode is selected, the operation mode and initial temperature set are determined by the initial room temperature at start-up of the operation except to turn off the air conditioner and operates it again.

(2) If the mode is change to "I Feel" from other mode, the "I Feel" mode doesn't operate until compressor stop for more than 3 minutes.

Mode	Initial Room Temperature	Initial Set Temperature
COOLING	RT≥26℃	23℃
DRY	26℃＞RT≥20℃	RT-2℃
HEATING for Heat Pump FAN for Cooling Only	RT＜20℃	-

- In the "I Feel" mode, when the controller receives the up or down signal of temperature, the set temperature can adjust by 1℃ upper or lower. The biggest you can adjust by 2℃ upper or lower.

3. "COOLING" Mode Operation

(1) Compressor frequency control

According to difference room temperature and set temperature(δ **t = RT-ST**), running frequency of compressor is controlled by electronic controller. When room temperature is much higher than set temperature, compressor will start at a high frequency, and as room temperature goes down, compressor running frequency will go down. When room temperature is lower than set temperature, compressor will run at very low frequency. In general, unit will change its running frequency according to δ **t** to make room temperature closing to set temperature.

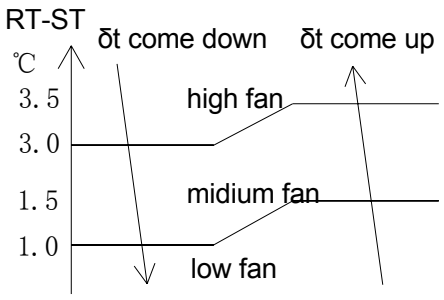
(2) Outdoor temperature affects running frequency of compressor

Outdoor temperature affect compressor's running frequency. Difference inlet temperature of outdoor unit is adapted by difference compressor running frequency. While outdoor temperature is about 30℃, the compressor will run in high frequency.

If unit run in "cooling" mode and outdoor temperature is less than -1℃, controller will shut down compressor and show error code, while the ambient temperature is over 0℃, the compressor will run automatically.

(3) Auto fan control in cooling mode

In cooling mode (include cooling in "I feel" mode), fan speed is determined by δ **t**, as the following diagram:



4. "DRY" Mode Operation

(1) The system for DRY operation used the same refrigerant circle as the cooling one.

(2) When the system operates in DRY mode, at first it operates in cooling mode at 16℃ or 18℃ for 3 minutes. After that, the system will operate in cooling mode with lowest fan speed, meanwhile the set temperature (**ST**) is "RT-2℃" which means that the ST is room temperature at then minus 2. During the course of this mode, the fan speed set operation and room temperature set are restricted, except the vane motor adjusting.

5. "HEATING" Mode Operation (available for Heat Pump only)

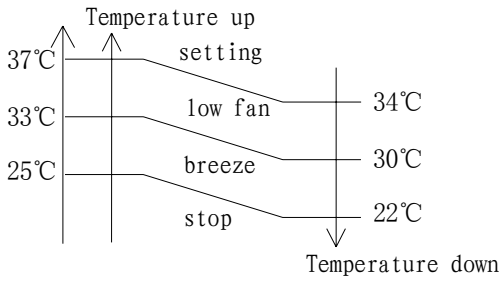
(1) Frequency control

The same as the frequency control in cooing mode, running frequency of compressor is controlled by controller. Unit change its running frequency according to δ **t** to make room temperature closing to the set temperature.

(2) Indoor fan motor control

1. Cold Air Prevention Control

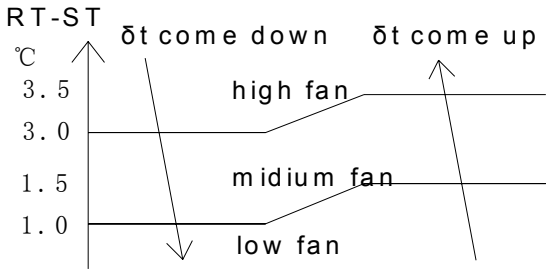
- The function is intended to prevent cold air from being discharged when the heating operation starts or when defrosting.
- The indoor fan speed will be controlled as following.



- In the heating operation, if the air conditioner is turned off, the indoor fan motor will run most for 30 seconds since the stop of compressor.

2. Auto fan control (heating)

In heating mode(include in "I feel" mode) , fan speed is determined by δ**t**, as the following:



(3) 4-way valve control

In heating mode, 4-way valve will power on ahead of compressor for 5 seconds, and cut off for 2 minutes later than compressor's stop. 4-way valve will not power off unless the machine is switched off, mode changed or on the process of defrosting.

(4) Defrosting

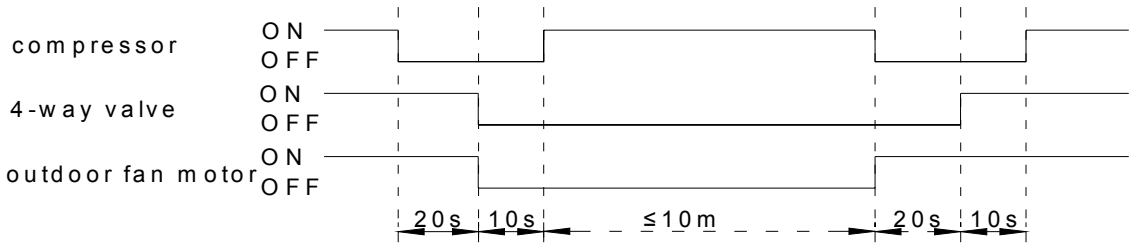
Defrosting is controlled by the microprocessor.

When one of the following conditions is satisfied, unit will come into defrosting:

a. Outdoor heat exchanger Temperature (OPT) is continuously less than 3℃ while the unit runs for more than 40 minutes, and OPT is keeping under -6℃ for more than 3 minutes.
b. Outdoor heat exchanger Temperature (OPT) is continuously less than 3℃ meanwhile the unit runs for more than 80 minutes, and OPT is keeping under -4℃ for more than 3 minutes.
c. Outdoor heat exchanger Temperature (OPT) is continuously less than 3℃ while the unit runs for more than 120 minutes, and OPT is keeping below -2℃ for more than 3 minutes.

Before the air con come into defrosting, compressor running frequency drop down to a lower frequency firstly, then the compressor shuts down.

In defrosting, the max. frequency of compressor is F9 (a little less than the highest frequency). In this period all protection function are avaliable.



In defrosting, LED showing by winking.

Come into or out of defrosting, indoor fan motor speed is the same as Cold Air Prevention Control.

One of the following conditions is satisfied, unit come out of defrosting and shift to heating mode:

a. Outdoor coil Temperature (OPT) ≥15℃

b. Defrost time keep time for more than 10 minutes.

(5) Indoor exchanger overheat protection

When Indoor exchanger Temperature(IPT) is higher than 55℃, unit come into indoor exchanger overheat protection. Compressor drop its frequency toward to F1 level until IPT≤52℃; If IPT≤52℃ and keep for 5 minutes , control system don't limit running frequency.

If IPT>62℃, control system shut down compressor, and recover when IPT drop less than 50℃.

6. "SLEEP" mode

When the SLEEP button is pressed, the SLEEP mode is selected as following:

- The indoor fan speed is set at low speed, the power lamp and the sleep lamp is on, the display of temperature will be close after 5 minutes.
- When selecting COOLING/DRY operation with SLEEP mode, the set temperature will be raised by 1℃ 1 hour later and by 2℃ 2 hour later.
- When selecting HEATING operation with SLEEP mode, the set temperature will be dropped by 1℃ 1 hour later and 2℃ 2hour later.
- After the System operates in SLEEP mode for 8 hours, it will stop automatically.

7. EMERGENCY Operation

When the EMERGENCY Operation switch is pressed once, COOLING mode is selected and if in 3 seconds the EMERGENCY Operation switch is pressed again, mode is selected. Then pressed once again, the unit is switch off.

When the remote controller is missing, has failed or the batteries run down, press the EMERGENCY Operation switch on the front of the indoor unit. The unit will start.

The first 30 minutes of operation will be the test run operation. The operation is for servicing. The indoor fan runs at high speed and the system is in continuous operation. The thermostat is ON and the timer is reset to normal.

After 30 minutes of test run operation the system shifts to AUTO COOLING/HEATING mode, and the indoor fan runs in automatic speed. The operation continues unit the EMERGENCY operation switch is pressed or a button on the remote controller is pressed, the normal operation will start.

NOTE: Do not press the EMERGEMCY Operation switch during normal operation.

8. AUTO-RESTART Function (Option)

1. When air conditioner is operating in one mode, all of its operation data, such as working mode and temperature of setup would be memorized into IC by main PCB. If power cuts due to

some reason, when power supply come back again, the AUTO-RESTART function will set synchronously and automatically to work. So the air conditioner would work at the same mode before.

Auto-restart Pre-setting (optional):

If Auto-restart function is needed, follow the steps below to activate this function:

1) Pulling the air-con's plug out of socket.

2) Pressing and holding the Emergency button (ON/OFF) on the indoor, then insert the plug into the socket again.

3) Keep pressing the Emergency button for more than 10 seconds until three short beeps are heard. The **Auto-restart** function has been started.

9. Protection and Failure Display

- When protection display is available, controller will show error code, digital LED shows error code and setting temperature by turns.
- If there is more than one failure, it will show at first that in front of the error list.
- Protection display function can be selected in hardware, and the default don't display;
- To insure of in and out communist is credibility, the failures relate to outdoor unit will remain failure state for 2 minutes max after recovered.
- In all failures, only sensor failures don't have to repower to cancel.
- **Error list**

Failure type	LED CODE	DIGITAL LED CODE
In and out communication failure	RUN、TIMER –both winking	E0
Outdoor communication failure	RUN、TIMER –both winking	EC
Outdoor sensor	RUN-1 time/8s	E1
Indoor coil temperature sensor	RUN-2 times /8s	E2
Outdoor coil temperature sensor	RUN-3 times /8s	E3
System abnormity	RUN-4 times /8s	E4
Type mismatch	RUN-5 times /8s	E5
Indoor fan motor	RUN-6 times /8s	E6
Outdoor temperature sensor	RUN-7 times /8s	E7
Discharge temperature sensor	RUN-8 times /8s	E8
Invert module abnormity	RUN-9 times /8s	E9
Outdoor fan motor（DC）	RUN-10 times /8s	EF
Current sensor	RUN－11 times /8s	EA
EEPROM failure	RUN-12 times /8s	EE
Top of compressor temperature switch	RUN-13 times /8s	EP
Voltage sensor	RUN-14 times /8s	EU

Protection display code list:

Protection type	LED CODE	DIGITAL LED CODE
higher or lower voltage	RUN-winking,TIMER-1 time/8s	P1
Over current	RUN- winking,TIMER-2 times /8s	P2
Discharge temperature	RUN- winking,TIMER-4 times /8s	P4
Over cooling in cooling mode	RUN-light,TIMER-5 times /8s	P5
Over heating in cooling mode	RUN- light,TIMER-6 times /8s	P6
Over heating in heating mode	RUN- light,TIMER-7 times /8s	P7
Outdoor temperature too high or low	RUN- light,TIMER-8 times /8s	P8
Drive protection(Overload)	RUN- winking,TIMER-9 times/8s	P9
Module self protection	RUN- winking,TIMER-10 times/8s	P0

- Outdoor failure display

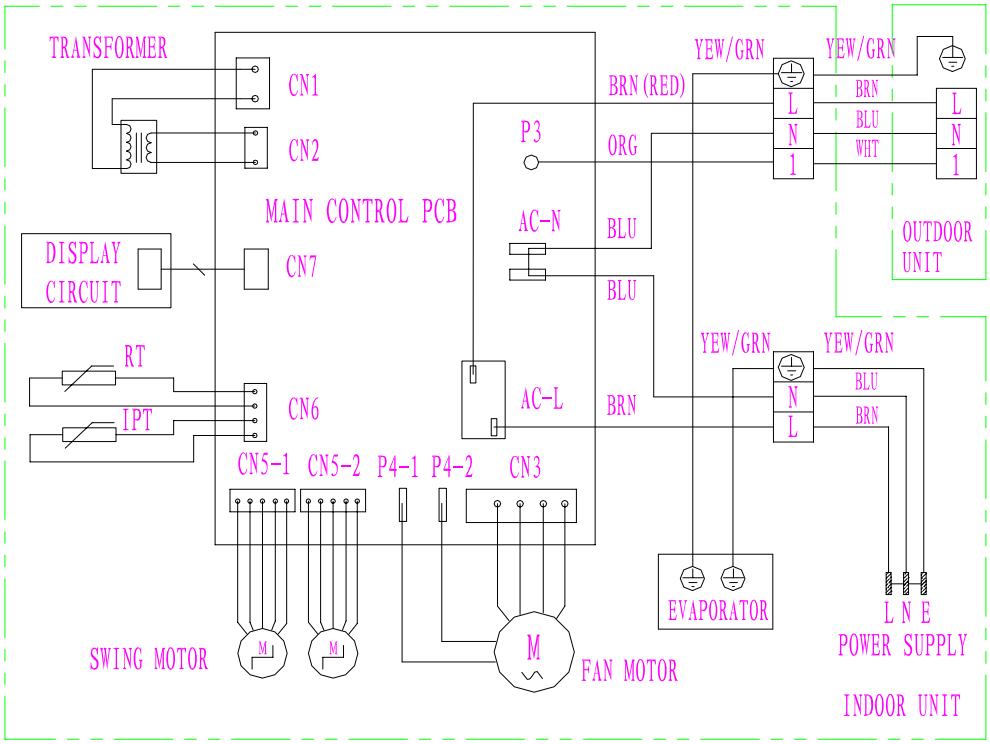
There is a LED on outdoor power board, when compressor is running; it is normally light; when no feedback of signal to power board from compressor, it will wink by lighting 1s and going out 1s. If failures happened, it will light 0.5s, go out 0.5s, winking several times and go out 3s for a cycle to indicate failures. The failure list is the follow:

Wink time	Failure
1	IPM protection
2	higher or lower voltage
3	Over current
4	Discharge temperature too high
5	Outdoor coil temperature too high
6	Drive abnormity
7	Communication abnormity with indoor unit
8	Compressor over heat（switch on top of compressor）
9	Outdoor air temperature sensor failure
10	Outdoor coil temperature sensor failure
11	Outdoor discharge pipe temperature sensor failure
12	Voltage sensor failure
13	Current sensor failure
14	IPM abnormity
15	Outdoor communication abnormity
16	DC fan motor no feedback
17	defrosting

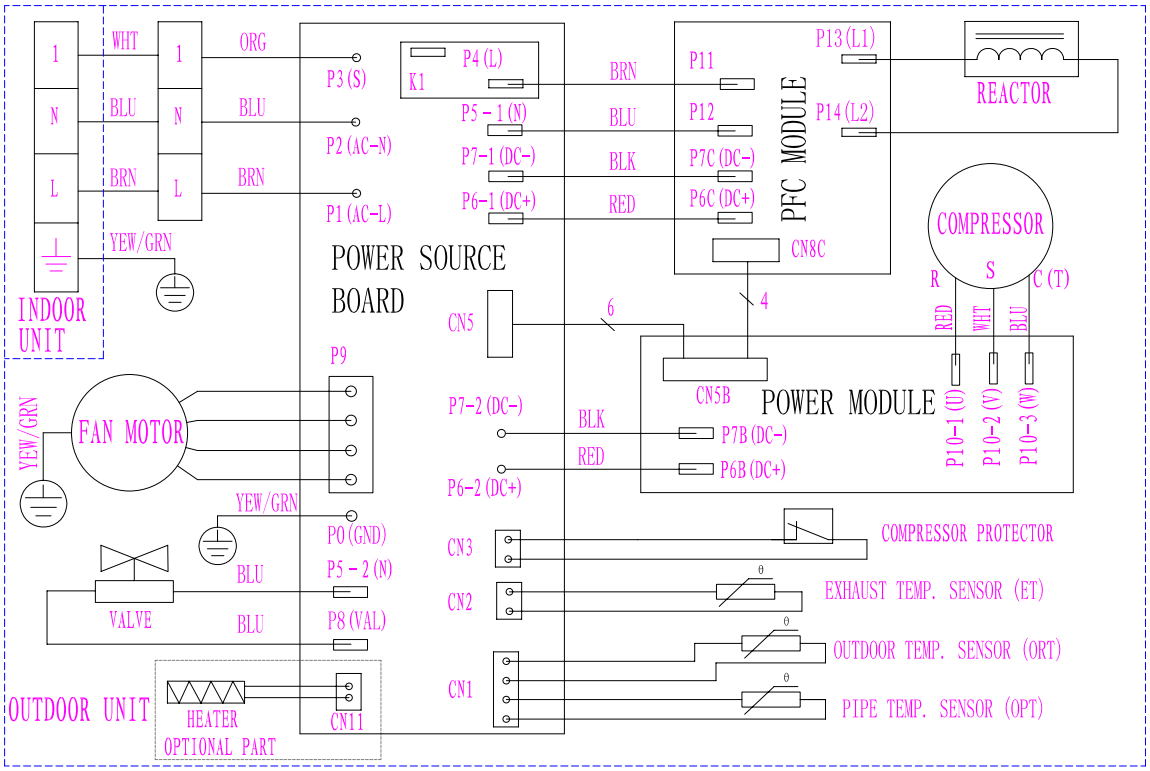
WIRING DIAGRAM

MODEL: PHP-5800/MI

INDOOR UNIT:

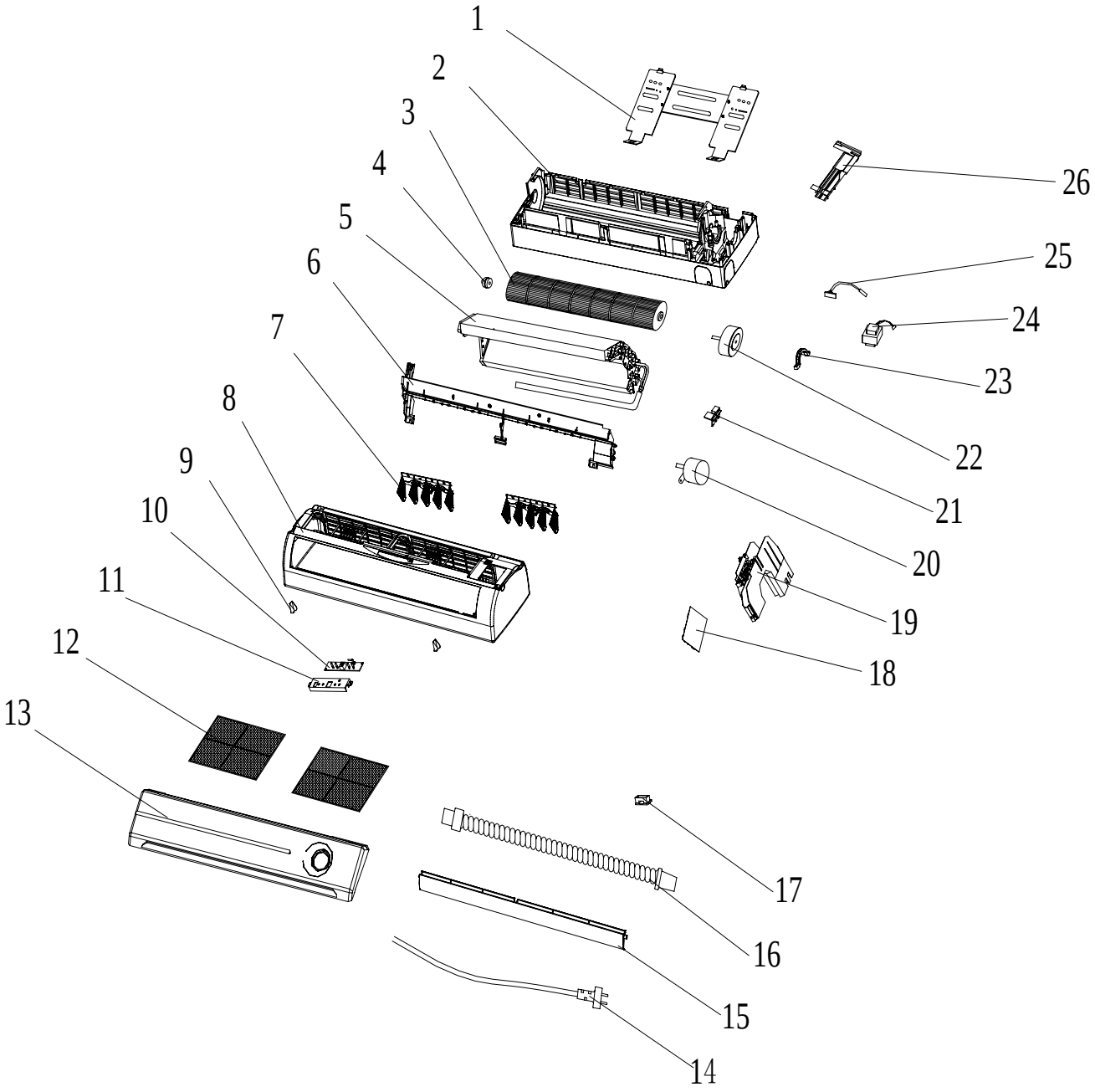


OUTDOOR UNIT:



EXPLOSION VIEW

Mode: PHP-5800/MI
INDOOR UNIT:

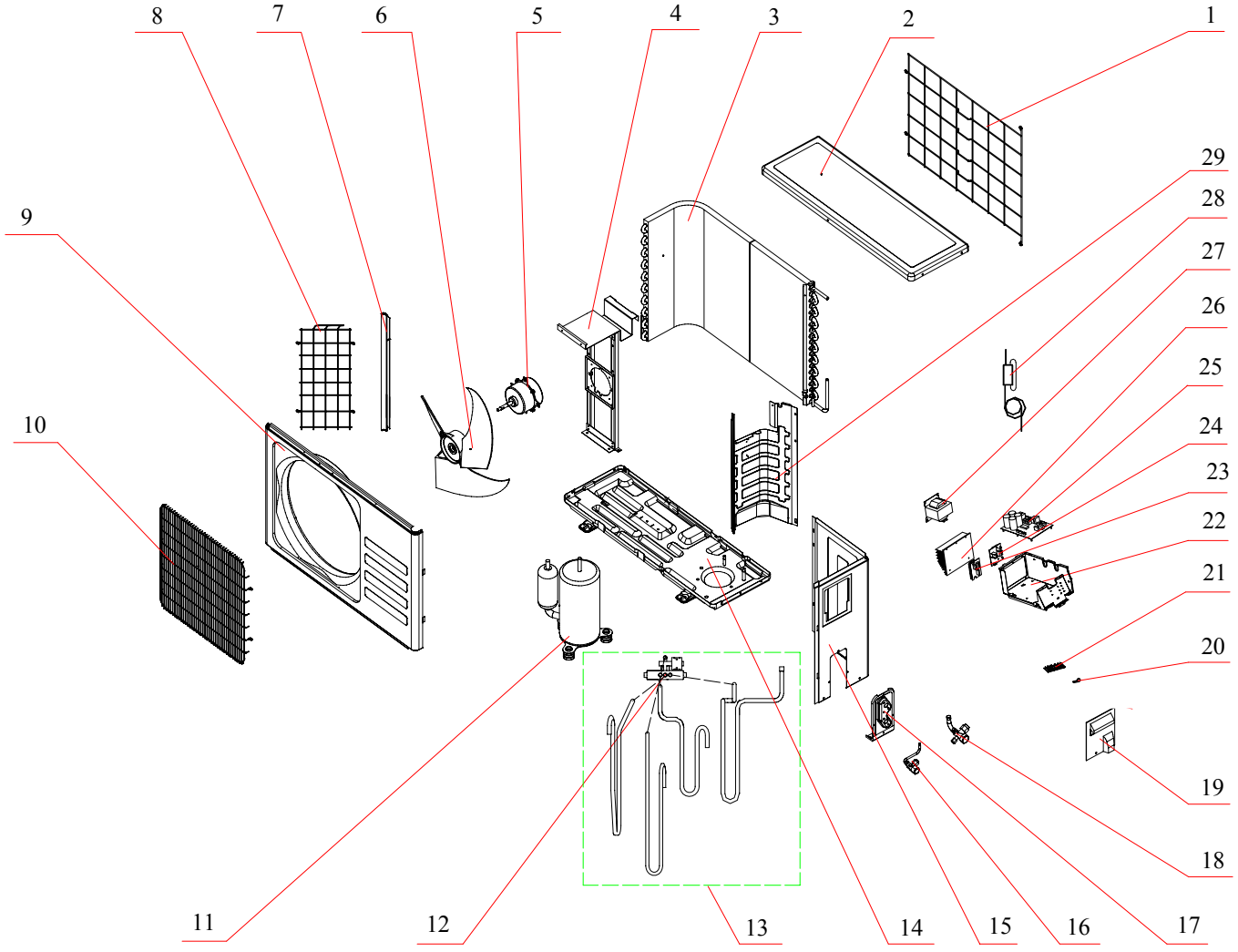


Indoor Unit-

No.	Part No.	Part Name	Q'ty	Remark
1	1080030021	Installation Plate	1	
2	1070350243	Base	1	
3	1070020024	Cross Fan	1	
4	1070100010	Bearing Mount	1	
5	1110050268	Evaporator	1	
6	1070350137	Water Drainage Assembly	1	
7	1070350141	Vertical Vane Assembly	1	
8	1070500250	Face Frame	1	
9	1073090111	Screw Cover	3	
10	1090320137	Display PCB(Digital)	1	
11	1070320135	Display PCB Box	1	
12	1070190012	Left Air Filter	1	
	1070190013	Right Air Filter	1	
13	1070450297	Front Panel	1	
14	1170120043	Power Supply Cord	1	
15	1070350140	Vane	1	
16	1070110011	Drainage Hose	1	
17	1070320114	Cable Clamp	1	
18	1090520188	Main PCB(Digital)	1	
19	1073090121	Electrical Box	1	
20	1170020011	Vane Motor	2	
21	1073030201	Sensor Holder	1	
22	1170030065	Indoor Motor	1	
23	1070350152	Indoor Motor Cover	1	
24	1170240001	Transformer	1	
25	1170230001	Indoor Sensor Assembly	1	
26	1070350245	In And Out Pipe Fixer	1	
27	1090010071	Remote Controller	1	Not shown in Explosion view
28	1073030303	Remote Controller Supporter	1	
29	1190060003	Indoor Carton	1	
30	1190060019	Left Foaming	1	
31	1190060020	Right Foaming	1	
32	1190060002	Middle Pasteboard Supporter	1	
33	1190060021	Middle Foaming Supporter	1	

EXPLOSION VIEW

Model: PHP-5800/MI
OUTDOOR UNIT



Outdoor Unit- PHP-5800/MI

No.	Part No.	Part Name	Q'ty	Remark
1	1081990065	Grille	1	
2	1070500400	Top Cover	1	
3	1110060422	Condenser	1	
4	1081990060	Outdoor Motor Supporter	1	
5	1170040118	Outdoor Motor	1	
6	1070030028	Propeller Fan	1	
7	1070500397	Left Grille Supporter	1	
8	1081990057	Left Handle	1	
9	1081990058	Front Plate	1	
10	1081990059	Fan Guard	1	
11	1100040045	Compressor And It Accessories	1	
12	1120500226	4-way Valve	1	
13	1120520553	4-way Valve Assembly	1	
14	1080520146	Base	1	
15	1081990054	Right Plate	1	
16	1120120021	Two-way Valve	1	
17	1081990055	Valve Supporter	1	
18	1120130032	Three-way Valve	1	
19	1073551103	Electrical Box Cover	1	
20	1070040001	Cable Clamp(ϕ 6)	1	
	1070040003	Cable Clamp(ϕ 8)	1	
21	1170500131	Terminal	1	
	1170500130	Terminal	1	
22	1081990010	Electrical Parts Box	1	
23	1090520168	PFC Board	1	
24	1090520167	Inverter module	1	
25	1090520189	Power source board	1	
26	1170330004	Radiator	1	
27	1170190002	Inductor	1	
28	1120520552	Capillary assembly	1	
29	1081990095	Partition plate	1	
30	1170230007	Pipe Temp. sensor and outdoor Temp. sensor	1	Not shown in Explosion view
31	1170230006	Discharge Temp. sensor	1	
32	1190070020	Base Carton	1	
33	1190530012	Cabinet Carton	1	
34	1190070066	Base Foaming	1	
35	1190070065	Cover Forming	1	